

THAT WHICH IS CLAIMED IS:

1. A system for identifying a preprinted form and interacting therewith, said system comprising:

a pen enabled computing device having a writing stylus;

a preprinted form cooperable with the pen enabled computing device and

5 comprising a page having a writing surface, a visual form identifier disposed on the writing surface and adapted to identify the nature of the page to the user, and a plurality of fields defined by the writing surface; and

a computer program product executing within the pen enabled computing 10 device and cooperating therewith to:

determine the disposition of the writing stylus adjacent to the writing surface in order to actuate the pen enabled computing device;

15 detect, capture, and store data input into the fields according to the nature of the page, the nature of the page comprising a function and a specific identity; and

identify the nature of the page to the pen enabled computing device based upon the data input into a plurality of the field.

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2. A system according to Claim 1 further comprising an electronic handwriting tablet capable of interacting with the pen enabled computing device and the preprinted form so as to sense the position and movement of the writing stylus with respect to a page engaged with the handwriting tablet.

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3. A system according to Claim 1 wherein the preprinted form comprises a plurality of pages having a predetermined order and the system is further capable of determining a function and a specific identity for each page corresponding to the order.

4. A system according to Claim 1 wherein the fields have a predetermined spatial arrangement on the writing surface according to the nature of the page and the pen enabled computing device detects and captures data input in a plurality of the fields to determine the nature of the page.

5. A system according to Claim 1 wherein data is input into each of a plurality of the fields and said pen enabled computing device and computer program product cooperate to process the data-containing fields to define a corresponding base 10 n number that uniquely identifies the nature of the page to the pen enabled computing device.

6. A system according to Claim 5 wherein said pen enabled computing device and said computer program product cooperate to define a base n number that corresponds to a transposable matrix having n rows and m+1 columns forming  $(n)*(m+1)$  matrix elements, each matrix element having a value corresponding to  $j*n^i$  and being represented by the coordinates (j, i), with i varying from 0 to m and j varying from 0 to n-1.

20        7.        A system according to Claim 1 wherein said computer program  
product further cooperates with said pen enabled computing device to access data  
stored within the pen enabled computing device, wherein the data accessed by said  
computer program product is selected from the group consisting of data that is  
associated with the specific identity of the page and data that is independent of the  
25      specific identity of the page.

8. A system according to Claim 1 further comprising a user interface, wherein the computer program product is further adapted to cooperate with the user interface to provide data to the user.

9. A system according to Claim 8 wherein, after the computer program product has determined the nature of the page, the pen enabled computing device and the computer program product cooperate to further determine whether data input into the fields continues to correspond to the determined nature of the page and to indicate 5 an error if the input data fails to correspond.

10. A system according to Claim 9 wherein the user interface is further capable of indicating the error to the user and prompting the user to correct the error through the pen enabled computing device.

11. A system according to Claim 9 wherein the user interface is further capable of indicating to the user at least one of the fields containing data, the data contained within the data-containing fields, and the number of fields containing data.

12. A system according to Claim 1 wherein the computer program product cooperates with the pen enabled computing device to detect, capture, and store handwritten data input into a field with the writing stylus by spatially segmenting the handwritten data and correlating the spatial segments with the nature of the page.

13. A system according to Claim 12 wherein the computer program product is further capable of assigning a stamp to data input into a field, the stamp corresponding to the nature of the page and comprising at least one of a time, a date, and a unique identifier.

14. A system according to Claim 1 wherein the pen enabled computing device further comprises an editing actuator and the computer program product is further capable of cooperating with the pen enabled computing device to edit data upon actuation of the editing actuator.

15. A system according to Claim 14 wherein, upon actuation of the editing actuator, the computer program product cooperates with the pen enabled computing

device to allow at least one of addition of data to data contained within a field, insertion of data between data elements contained within a field, deletion of data contained within a field, and replacement of data contained within a field with alternate data.

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16. A system according to Claim 13 wherein the computer program product is further capable of determining whether data is being input into a data-containing field having a preassigned stamp and prompting the user through the user interface to verify that the user intends to edit the data within the field if data is being 10 input into a data-containing field having a preassigned stamp.

17. A system according to Claim 1 wherein the computer program product is further capable of cooperating with the pen enabled computing device to at least one of export data and import data in relation to at least one of an external computing 15 device and the pen enabled computing device.

18. A system according to Claim 17 wherein the computer program product is further capable of reconciling transmission of data corresponding to the nature of a page at least one of between the pen enabled computing device and the 20 external computing device, within the pen enabled computing device, and within the external computing device.

19. A system according to Claim 17 wherein the computer program product is capable of allowing at least one of the pen enabled computing device and 25 the external computing device to access data corresponding to the nature of a page and to examine and manipulate data contained within the fields thereof.

20. A system according to Claim 17 further comprising a conversion actuator capable of selectively directing data contained within a field to be converted 30 into text.

21. A system according to Claim 1 wherein the system is further capable of selectively converting data contained within a field into text.

22. A computer program product adapted to execute within a pen enabled computing device having a writing stylus and to identify the nature of a preprinted form to the pen enabled computing device, the form comprising a page having a writing surface defining a plurality of fields, the nature of the page comprising a function and a specific identity, said computer program product comprising:

10 a first executable portion for determining the disposition of the writing stylus adjacent to the writing surface such that the writing stylus is capable of interacting with the fields in order to actuate the pen enabled computing device;

15 a second executable portion for detecting, capturing, and storing data input into the fields with the writing stylus, the data being input according to the nature of the page; and

20 a third executable portion for identifying the nature of the page to the pen enabled computing device based upon data input into a plurality of the fields.

23. A computer program product according to Claim 22 wherein the computer program product is further adapted to facilitate interaction between the pen enabled computing device and an electronic handwriting tablet capable of sensing position and movement of the writing stylus with respect to a page engaged therewith.

24. A computer program product according to Claim 22 wherein the form comprises a plurality of pages having a predetermined order and the computer program product further comprises a fifth executable portion for determining a function and a specific identity for each page corresponding to the order.

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25. A computer program product according to Claim 22 wherein the fields have a predetermined spatial arrangement on the writing surface according to the nature of the page and the second executable portion of the computer program product detects and captures data input in a plurality of the fields to enable the pen enabled computing device to determine the nature of the page.

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26. A computer program product according to Claim 22 wherein data is input into each of a plurality of the fields and said computer program product then processes the data-containing fields to define a corresponding base n number that uniquely identifies the nature of the page to the pen enabled computing device.

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27. A computer program product according to Claim 26 wherein the computer program product is capable of defining a base n number corresponding to a transposable matrix having n rows and m+1 columns and forming  $(n)*(m+1)$  matrix elements, each matrix element having a value corresponding to  $j*n^i$  and being represented by the coordinates (j, i), with i varying from 0 to m and j varying from 0 to n-1.

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28. A computer program product according to Claim 22 wherein the fourth executable portion is further capable of accessing data stored within the pen enabled computing device, wherein the data accessed by said computer program product is selected from the group consisting of data that is associated with the specific identity of the page and data that is independent of the specific identity of the page.

29. A computer program product according to Claim 22 wherein the pen enabled computing device further comprises a user interface and the computer program product further comprises a sixth executable portion adapted to cooperate with the user interface to provide data to the user.

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30. A computer program product according to Claim 29 further comprising a seventh executable portion for determining whether, after the third executable portion has determined the nature of the page, data input into the fields continues to correspond to the determined nature of the page and to indicate an error if the input data fails to correspond.

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31. A computer program product according to Claim 30 wherein the seventh executable portion is further capable of indicating the error to the user through the user interface and prompting the user to correct the error through the pen enabled computing device.

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32. A computer program product according to Claim 30 wherein the seventh executable portion is further capable of indicating to the user through the user interface at least one of the fields containing data, the data contained within the data-containing fields, and the number of fields containing data.

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33. A computer program product according to Claim 22 wherein the second executable portion detects, captures, and stores handwritten data input into a field with the writing stylus by spatially segmenting the handwritten data and correlating the spatial segments with the nature of the page.

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34. A computer program product according to Claim 33 further comprising an eighth executable portion for assigning a stamp to data input into a field, the stamp corresponding to the nature of the page and comprising at least one of a time, a date, and a unique identifier.

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35. A computer program product according to Claim 22 wherein the pen enabled computing device further comprises an editing actuator and the computer program product further comprises a ninth executable portion for enabling editing of data upon actuation of the editing actuator.

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36. A computer program product according to Claim 35 wherein the ninth executable portion, upon actuation of the editing actuator, at least one of adds data to data contained within a field, inserts data between data elements contained within a field, deletes data contained within a field, and replaces data contained within a field with alternate data.

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37. A computer program product according to Claim 34 further comprising a tenth executable portion for determining whether data is being input into a data-containing field having a preassigned stamp and prompting the user through the user interface to verify that the user intends to edit the data within the field if data is being input into a data-containing field having a preassigned stamp.

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38. A computer program product according to Claim 22 further comprising an eleventh executable portion capable of at least one of exporting data to and importing data in relation to at least one of an external computing device and the pen enabled computing device.

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39. A computer program product according to Claim 38 wherein the eleventh executable portion is further capable of reconciling transmission of data corresponding to the nature of a page at least one of between the pen enabled computing device and the external computing device, within the pen enabled computing device, and within the external computing device.

40. A computer program product according to Claim 38 further comprising a twelfth executable portion capable of allowing at least one of the pen enabled computing device and the external computing device to access data corresponding to

the nature of a page and to examine and manipulate data contained within the fields thereof.

41. A computer program product according to Claim 38 wherein the pen  
5 enabled computing device further comprises a conversion actuator and the computer  
program product further comprises a thirteenth executable portion capable of  
selectively directing data contained within a field to be converted into text by at least  
one of the pen enabled computing device and the external computing device upon  
actuation of the conversion actuator.

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42. A computer program product according to Claim 22 further comprising  
a fourteenth executable portion capable of selectively converting data contained  
within a field into text.

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43. A pen enabled computing device adapted for use with a preprinted  
form comprising a page having a writing surface, a visual form identifier disposed on  
the writing surface and adapted to identify the nature of the page to a user, and a  
plurality of fields defined by the writing surface and arranged to correspond to the  
nature of the page, the nature of the page comprises a function and a specific identity,  
20 said pen enabled computing device comprising:

a writing stylus; and

a sensing device adapted to engage the preprinted form and cooperating with  
the writing stylus such that the pen enabled computing device is  
actuated when the writing stylus is disposed adjacent to the writing  
surface in interactable relation with the fields and is thereby enabled to  
determine the nature of the page as data is input into the fields with the  
writing stylus according to the user-identified nature of the page.

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44. A pen enabled computing device according to Claim 43 wherein the  
30 sensing device comprises an electronic handwriting tablet adapted to engage the

preprinted form and capable of sensing position and movement of the writing stylus with respect to the page.

45. A pen enabled computing device according to Claim 43 wherein the  
5 pen enabled computing device is configured to be capable of determining the nature  
of a form comprising a plurality of pages having a predetermined order where each  
page has a function and a specific identity corresponding to the order.

46. A pen enabled computing device according to Claim 43 wherein the  
10 pen enabled computing device is configured to require data to be input into a plurality  
of the fields in order to determine the nature of the page therefrom, the fields having a  
predetermined spatial arrangement on the writing surface according to the nature of  
the page.

15 47. A pen enabled computing device according to Claim 43 wherein the  
pen enabled computing device is configured to define a base n number that uniquely  
identifies the nature of the page from data input into each of a plurality of the fields.

20 48. A pen enabled computing device according to Claim 47 wherein the  
pen enabled computing device is configured to define a base n number corresponding  
to a transposable matrix having n rows and m+1 columns forming  $(n)*(m+1)$  matrix  
elements, each matrix element having a value corresponding to  $j*n^i$  and being  
represented by the coordinates (j, i), with i varying from 0 to m and j varying from 0  
to n-1.

25 49. A pen enabled computing device according to Claim 43 wherein the  
pen enabled computing device is configured to enable access to other data stored  
therein associated with the specific identity of the page after the nature of the page is  
determined.

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50. A method for identifying the nature of a page of a preprinted form with a pen enabled computing device having a writing stylus and interacting therewith, the nature of the page comprising a function and a specific identity, the page having a writing surface, a visual form identifier disposed on the writing surface and adapted to 5 identify the nature of the page to a user, and a plurality of fields defined by the writing surface, said method comprising:

determining the disposition of the writing stylus adjacent to the writing surface such that the writing stylus is capable of interacting with the fields;  
receiving data into the fields via the writing stylus and according to the nature 10 of the page;  
determining the nature of the page from a plurality of the fields in which data is received; and  
identifying the nature of the page to the pen enabled computing device.

15 51. A method according to Claim 50 further comprising allowing access to other data stored within the pen enabled computing system and associated with the specific identity of the page.

20 52. A method according to Claim 50 wherein the form comprises a plurality of pages having a predetermined order and the method further comprises determining a function and specific identity for each page corresponding to the order.

53. A method according to Claim 50 wherein the fields are defined by the writing surface according to a predetermined spatial arrangement and the method further comprises determining the nature of the page from the spatial arrangement of the plurality of the fields in which data is received.

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54. A method according to Claim 50 wherein determining the nature of the page from a plurality of the fields in which data is received further comprises processing the data input into each of the plurality of the fields to define a base n number uniquely corresponding to the nature of the page.

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55. A method according to Claim 54 wherein processing the data input further comprises defining a base n number corresponding to a transposable matrix having n rows and m+1 columns to form  $(n)*(m+1)$  matrix elements, each matrix element having a value corresponding to  $j*n^i$  and being represented by the coordinates 15 (j, i), with i varying from 0 to m and j varying from 0 to n-1.

56. A method according to Claim 50 further comprising sensing the position and movement of the writing stylus with respect to the page with an electronic handwriting tablet engaged with the page.

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57. A method according to Claim 50 further comprising allowing access to other data stored within the pen enabled computing system that is independent of the specific identity of the page.

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58. A method according to Claim 50 further comprising providing data to the user via a user interface cooperable with the pen enabled computing device.

59. A method according to Claim 58 further comprising, after the nature of the page has been identified to the pen enabled computing device, determining whether data input into the fields continues to correspond to the determined nature of the page and indicating an error if the input data fails to correspond.

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60. A method according to Claim 59 further comprising indicating an error to the user through the user interface and prompting the user to correct the error using the pen enabled computing device.

10 61. A method according to Claim 59 further comprising indicating to the user via the user interface at least one of the fields containing data, the data contained within the data-containing fields, and the number of fields containing data.

15 62. A method according to Claim 50 further comprising detecting, capturing, and storing handwritten data input into a field with the writing stylus by spatially segmenting the handwritten data and correlating the spatial segments with the nature of the page.

20 63. A method according to Claim 62 further comprising assigning a stamp to data input into a field, the stamp corresponding to the nature of the page and comprising at least one of a time, a date, and a unique identifier.

64. A method according to Claim 50 further comprising actuating an editing actuator so as to enable the pen enabled computing device to edit data.

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65. A method according to Claim 64 further comprising, after actuating the editing actuator, enabling the pen enabled computing device to at least one of add data to data contained within a field, insert data between data elements contained within a field, delete data contained within a field, and replace data contained within a field  
5 with alternate data.

66. A method according to Claim 63 further comprising determining whether data is being input into a data-containing field having a preassigned stamp and prompting the user through the user interface to verify that the user intends to edit  
10 the data within the field if data is being input into a data-containing field having a preassigned stamp.

67. A method according to Claim 50 further comprising enabling the pen enabled computing device to at least one of export data and import data in relation to  
15 at least one of an external computing device and the pen enabled computing device.

68. A method according to Claim 67 further comprising reconciling transmission of data corresponding to the nature of a page at least one of between the pen enabled computing device and the external computing device, within the pen  
20 enabled computing device, and within the external computing device.

69. A method according to Claim 67 further comprising allowing at least one of the pen enabled computing device and the external computing device to access data corresponding to the nature of a page and to examine and manipulate data  
25 contained within the fields thereof.

70. A method according to Claim 67 further comprising selectively directing data contained within a field to be converted into text.

30 71. A method according to Claim 50 further comprising selectively converting data contained within a field into text.

72. A method for editing handwritten data using a pen enabled computing device having a writing surface and a writing stylus selectively communicable with the writing surface, said method comprising:

- 5        detecting the position and movement of the writing stylus with respect to the writing surface to form a handwritten input;
- defining a bounding box encompassing at least a portion of each stroke of the handwritten input;
- storing the handwritten input and the bounding box encompassing at last a portion of each stroke thereof; and
- 10      editing the handwritten input to at least one of add textual data to the handwritten input, insert textual data between strokes encompassed by adjacent bounding boxes, delete at least one stroke encompassed by a bounding box, and replace at least one stroke encompassed by a bounding box with alternate textual data.
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73. A method according to Claim 72 wherein detecting the position and movement of the writing stylus comprises sampling the motion of the writing stylus with respect to the writing surface so as to form a coordinate representation of each stroke of the handwritten input.

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- 74. A method according to Claim 73 wherein editing the handwritten input comprises receiving an indication from a user of the handwritten input to be edited and receiving textual input from a keyboard to form the textual data with which the handwritten input is edited.
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75. A method according to Claim 74 wherein editing further comprises  
altering the coordinate representation of at least some strokes of the handwritten input  
in order to alter spacing of at least one stroke encompassed by a bounding box so as to  
at least one of insert the textual input between strokes encompassed by adjacent  
5 bounding boxes and replace a stroke encompassed by a bounding box containing  
handwritten input with the textual input.

76. A system for editing handwritten data comprising:  
a pen enabled computing device having a memory element, a writing surface,  
10 and a writing stylus selectively communicable with the writing surface;  
and  
a computer program product executing within said pen enabled computing  
device and cooperating therewith for:  
detecting the position and movement of the writing stylus with respect  
15 to the writing surface to form a handwritten input;  
defining a bounding box encompassing at least a portion of each stroke  
of the handwritten input;  
storing the handwritten input and the bounding box encompassing at  
least a portion of each stroke thereof; and  
20 editing the handwritten input to at least one of add textual data to the  
handwritten input, insert data between strokes encompassed by  
adjacent bounding boxes, delete at least one stroke  
encompassed by a bounding box, and replace at least one stroke  
encompassed by a bounding box with alternate textual data.

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77. A system according to Claim 76 wherein said computer program product  
samples the motion of the writing stylus with respect to the writing surface so as to form  
a coordinate representation of each stroke of the handwritten input.

78. A system according to Claim 77 wherein said pen enabled computing device and said computer program product cooperate for receiving an indication from a user of the handwritten input to be edited and also for receiving textual input from a 5 keyboard to form the data with which the handwritten input is edited.

79. A system according to Claim 78 wherein said computer program product edits the handwritten input by altering the coordinate representation of at least some strokes of the handwritten input in order to alter spacing of at least one stroke 10 encompassed by a bounding box so as to at least one of insert the textual input between strokes encompassed by adjacent bounding boxes and replace a stroke encompassed by a bounding box containing handwritten input with the textual input.

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